

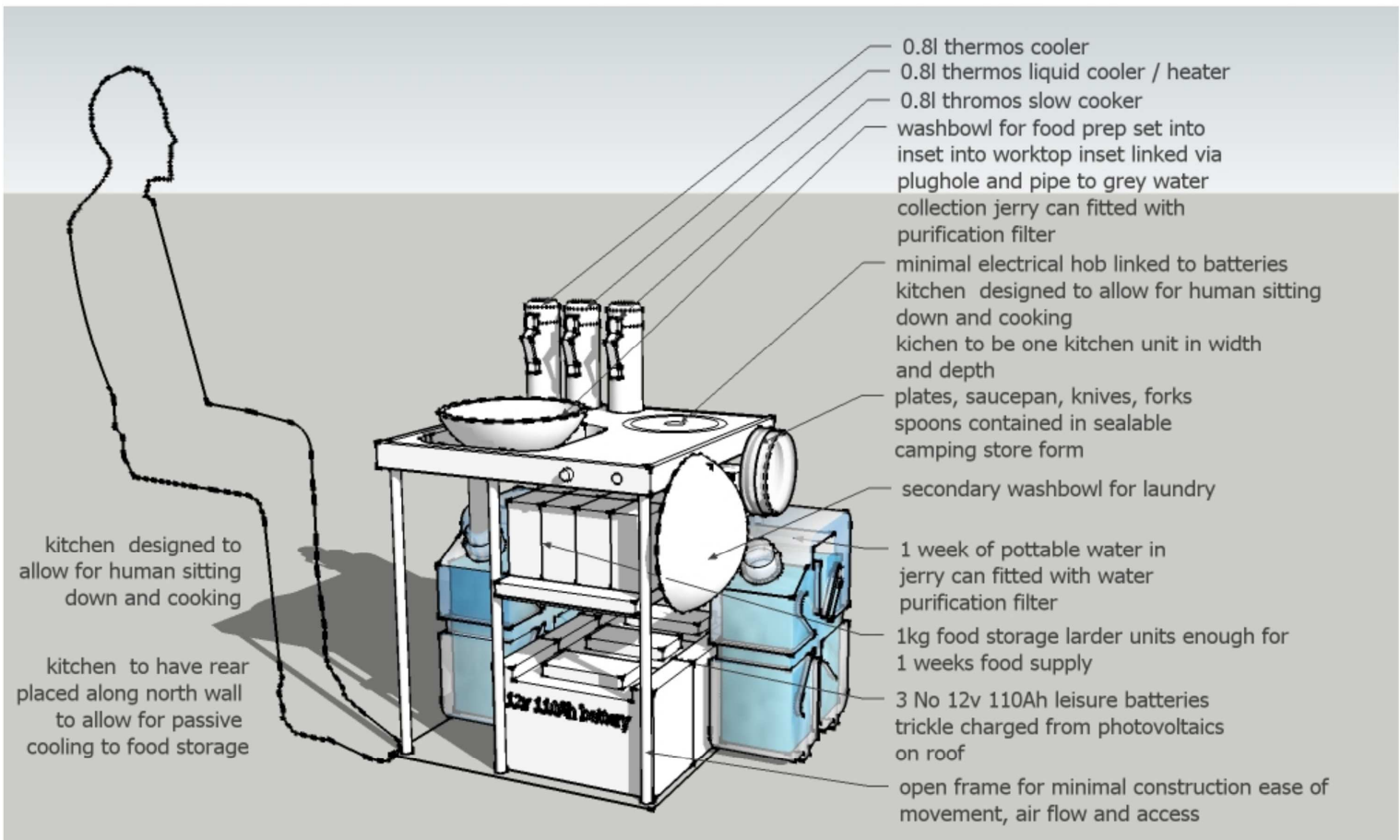
The storage area is envisaged for a habitation without mains electric, water, gas, lighting, sewerage. Using passive heating, cooling and ventilation. The storage space contains solar shower bag shower, grey water jerry can refilled from removeable shower tray, portable chemical toilet

large clothes rack with space below rack for shoes and for personal phone, tablet, LED portable light powered from solar laptop charger

hand powered manual washing machine and clothes drying rack

mini kitchen comprising bowl, 3 thermos flasks, one for a fridge, one for liquids and one for a thermal slow cooker, sink linked to grey water in separate jerry can linked to sink outlet, 1 weeks supply of water in a jerry can with water purification, plates, knives, forks, spoons in camping set, secondary washing bowl. 1 weeks supply of food in container storage. domestic plastic recycling unit and 3d printer

3 No 12v 110Ah leisure batteries trickle charged from photovoltaics on roof
Storage space assists a building volume based on EU target energy use level
= 30 kWh/m²/yr = 1110 kwh/yr = 3kwh/day
= 2 No, 200 watt, glass fronted, mono-crystalline, photovoltaic panels. With a maximum of 50 % discharge allowed to reduce recharge time rate
= 124Ah/day
= 3/110Ah batteries trickle charged in parallel
= 3960 watts / day available in batteries
= assumed maximum energy use rate of 2220 watts/day from cooker hob, domestic plastic recycling unit and 3d printer



- 0.8l thermos cooler
- 0.8l thermos liquid cooler / heater
- 0.8l thromos slow cooker
- washbowl for food prep set into inset into worktop inset linked via plughole and pipe to grey water collection jerry can fitted with purification filter
- minimal electrical hob linked to batteries kitchen designed to allow for human sitting down and cooking
- kichen to be one kitchen unit in width and depth
- plates, saucepan, knives, forks spoons contained in sealable camping store form
- secondary washbowl for laundry
- 1 week of pottable water in jerry can fitted with water purification filter
- 1kg food storage larder units enough for 1 weeks food supply
- 3 No 12v 110Ah leisure batteries trickle charged from photovoltaics on roof
- open frame for minimal construction ease of movement, air flow and access

kitchen designed to allow for human sitting down and cooking

kitchen to have rear placed along north wall to allow for passive cooling to food storage

Works Package	Construction Element	Materials	Labour	Total
Works Package 1	Set up, Clearance, Demolitions over a 26.5m x 10m site	£ 750.00	£ 750.00	£ 1,500.00
Works Package 2	Foundations (<i>up to DPC</i>) timber baulk type	£ 1,250.00	£ 1,250.00	£ 2,500.00
Works Package 3	Ground Insulated suspended timber floor	£ 1,500.00	£ 1,500.00	£ 3,000.00
Works Package 4	Link from one svp external to house to main sewer	£ 1,250.00	£ 1,250.00	£ 2,500.00
Works Package 5	External and Internal Green living tray, pocket and cable wall	£ 5,000.00	£ 5,000.00	£ 10,000.00
Works Package 6	External Wool Insulated Timber Frame & Internal Utility area walls	£ 5,000.00	£ 5,000.00	£ 10,000.00
Works Package 7	Intermediate Floor Zone (Not applicable)	£ -	£ -	£ -
Works Package 8	Rocket timber fueled stove and flue	£ 1,250.00	£ 1,250.00	£ 2,500.00
Works Package 9	Sedum, Green Living Roof, insulated timber deck	£ 5,000.00	£ 5,000.00	£ 10,000.00
Works Package 10	Joinery - Recycled Glass Rooflight windows, Utility area pod and benches	£ 1,000.00	£ 1,000.00	£ 2,000.00
Works Package 11	Photovoltaic panel, batteries, inverter, plastic recycler, 3d printer, clothes rack, hand cranked washing machine	£ 1,500.00	£ 1,500.00	£ 3,000.00
Works Package 12	Electrical Installation (Not applicable) - No mains electric solar cells to all appliances	£ -	£ -	£ -
Works Package 13	Plumbing Installation (Not applicable) - No mains plumbing All minimal portable appliances, jerry can pottable water storage, jerry can grey water storage, portable chemical toilet	£ -	£ -	£ 1,000.00
Works Package 14	Heating Installation (Not applicable) Dwelling passively heated	£ -	£ -	£ -
Works Package 15	Plastering (Not applicable) green wall installation	£ -	£ -	£ -
Works Package 16	Kitchen and Utility Units - Minimal Kitchen with passive vacuum cooker, cooler and drink holder	£ -	£ -	£ 1,000.00
Works Package 17	Decorations & Wall Ceramics (Not applicable)	£ -	£ -	£ -
Works Package 18	Floor Finishes - Timber deck	£ 500.00	£ 500.00	£ 1,000.00
	Note: All materials to be sourced from local recycled demolition sites All plant materials and labour to be split as the self-builder occupier needs to complete the works at there own timescale and budget ability Dwelling area 56m ² Height from ground 3.150m Dwelling area dimensions approx. 8m x 7m			
	TOTAL	£ 24,000.00	£ 24,000.00	£ 50,000.00

Self Build on a Shoestring ideas competition entry

A Post 2020 Architectural Solution

Architecture needs to respond to the following challenges to create new houses for the post 2020 period.

Reduced availability of natural materials
Reduced energy
Reduced environmental quality.

FORM PRINCIPLES:

Passive design

Compact volume

Recycled materials

Material recycling within dwelling

Natural replenish able materials

Reduced use of energy

Reduced environmental depletion.

Increased environment on original site

Food production at dwelling for occupants

Increased resources.

Passive Energy Use.

Passive Natural Lighting

Passive Ventilation

Passive Heating

Rainwater Harvesting

Water Recycling

Improved CO2 Footprint

Localized self-dependency methods of living.

Open Plan

Minimal Openings

Even Thermal Environment

SITE:

Existing available plot.

CONSTRUCTION METHOD:

Self Build with subcontractor assist.

TIMESCALE:

To suit builder / occupants needs and abilities.

Self Build on a Shoestring ideas competition entry

A Post 2020 Architectural Solution

Architecture needs to respond to the following challenges to create new houses for the post 2020 period.

*Reduced availability of natural materials
Reduced energy
Reduced environmental quality.*

The form of the new dwelling solves these problems and provides an ongoing adaptable resource point for the survival of its occupants as the mass, state controlled, energy intensive, support system changes to localized self-dependency methods of living.

It is intended to be located on an existing cleared housing plot. The original structure being more profitable to leave to deteriorate or to be demolished or to be stripped and recycled.

The dwelling has a compact volume to reduce its carbon and CO2 footprint, simplify construction and reduce costs to the occupier.

There are minimal openings in the wall areas. Where openings exist they are doubled up as ventilation points.

The layout is open plan. All of the current room subdivisions are removed to allow for an even thermal environment.

The only furniture consideration is for two couches. These allow for daily interaction and also double up as sleeping points.

The height is single storey with roof access. This is determined by the natural sun angle and height for Britain. The single storey reduces overshadowing on the surrounding land to assist day lighting, temperature control and crop growth.

The flat roof acts as a garden, water collection area and also increases the green foot-print of the building by replacing the land lost to the dwelling.

The envelope is to be constructed from materials created by low energy input.

Concrete, brickwork, blockwork, steel, metals, petroleum based products are not used since they need a high energy input to be created.

Glass is used but it is to be from recycled sources.

The design envisages a wool insulated, timber foundation and construction, rain screen wall, with external and internal green food walls.

The green walls also change the temperature around the building by the plants automatically tracking the sun and altering the albedo of the envelope. The green walls increase the land area of the original site beyond that before the dwelling was established.

The current use of eaves detailing is removed in favour of a natural rainwater irrigation gutter that irrigates the green walls.

The glass roof area around the perimeter assists the growth of the internal green food walls as well as providing natural lighting to the interior.

The dwelling is passively heated, ventilated and lit.

The central rocket stove heats the dwelling. The flu to the stove is vented through the roof and acts as a radiator to the dwelling volume. The addition of a water jacket around the flu allows heat from the flu to be use for the production of hot water.

The current collection of storage areas and appliances is brought together in a localized utility area containing

- a domestic sized plastic recycling system and 3d printer to produce any product necessary for the dwelling or occupants
- a clothes cupboard
- a solar powered shower
- a portable chemical wc
- a manual had powered washing machine
- a minimal mobile kitchen
- thermal slow cooking flask
- thermal fridge flask
- thermal drinks flask
- 1 week potable water storage in a transparent jerry can fitted with a water filter.
- grey water storage in a transparent jerry can
- 1 weeks supply of food in container storage

The dwelling has no mains electrical system.

Instead it has a battery rack recharged off photovoltaic cells located on the roof area directly above the utility area to minimize service connections, power loss and materials such as insulation, from petroleum distillation and copper which is reaching its peak resource level.

The plastic recycler and 3d printer are run off this battery rack.

Secondary appliances for communications and media interaction are envisaged to be portable and have independent solar chargers.

Secondary lighting is by portable LED lights carried by the occupants to wherever they need it. There are no mains electrical plugs, wiring circuit or boards in the habitat

The habitats water supply is initially via the mains but as energy depletion increases water treatment will become more problematic in communities. The dwelling is designed to use a manual, portable, collection, filtration and treatment water system.

There is no foul drainage system into the building.

Sewage treatment is initially via the mains supply to a disposal point external to the dwelling to ensure maximum health control measures.

The portable, chemical WC is emptied into this capped SVP connection external to the dwelling.

If the sewage system locally is shut down due to energy depletion then the dwelling links to a bio-gas unit on the north of the dwelling.

This would comprise a slurry tank, digester, gas holder, outlet tank, compost tank, secondary digester, gas holder, and outlets to aeration tanks on the boundary of the site. The final output of the aeration tanks is spread into allotment plots in a rotational sequence over a six month period before being acceptable as a growing medium.

The portable solar powered shower can be emptied into to the grey water storage.

The kitchen waste water is held in a bowl and emptied into the grey water storage.

The dwelling can produce its own food crop off the green wall gardens. This reduces energy depletion in the acquiring and

transporting of food.

Communities will shrink and compact after 2020 following oil depletion in order to conserve energy.

Outer suburb areas will become isolated, uninhabited and then recycled for materials.

It is envisaged that the maximum travel time from a habitation centre in a town or city will be one hour walking time.

The depletion of oil reserves, gas reserves and the necessary raw materials to maintain or replace a motor vehicle indicate that vehicles will be phased out after 2020. Consequently the dwelling does not allow for a vehicle.

The dwelling is envisaged to be constructed by the occupiers.